Appl. No.: 09/678,480
Applicant(s): Luis Aldaz, et al.
Filed: October 2, 2002

TC/A.U.: 2600/2634
Examiner: Curtis B. Odom

Atty. Docket: US 008631

Title: METHOD AND APPARATUS FOR COMBINED FINGER MANAGEMENT AND FINGER LOCK FOR MULTIPATH SIGNALS IN A WIRELESS COMMUNICATION SYSTEM

APPEAL BRIEF

Honorable Assistant Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

In connection with the Notice of Appeal effective September 20, 2007, Applicants provide the following Appeal Brief in the above-captioned application.

1. Real Party in Interest

The real party in interest as assignee of the entire right and title to the invention described in the present application is NXP Semiconductors Netherlands B.V. having its principle place of business at High Tech Campus 60 5656 AG Eindhoven The Netherlands.[1]

2. Related Appeals and Interferences

There are no known related appeals or interferences at this time.

3. Status of the Claims

Claims 1-21 are pending in the application. No claims are cancelled; and no claims are withdrawn from consideration. Claims 1-21 are the subject of the present Appeal. Claims 1-21 have been finally rejected. Rejected claims 1-21 are duplicated in the Appendix.

4. Status of Amendments

A final Office Action on the merits was mailed on July 26, 2007. A Notice of Appeal was filed on October 26, 2007.

5. Summary of the Claimed Subject Matter[2]

In accordance with a representative embodiment, a method (5000) of managing fingers for multipath signals in a wireless communication device includes: receiving the multipath signals at the wireless communication device (5002); acquiring one of the

1 The undersigned is of the understanding that title to the present application was conveyed from Koninklijke Philips N.V. to NXP Semiconductors Netherlands B.V. and has been instructed to file the present Brief on behalf of NXP.

2 In the description to follow, citations to various reference numerals, drawings and corresponding text in the specification are provided solely to comply with Patent Office Rules. It is emphasized that these reference numerals, drawings and text are representative in nature, and in not any way limiting of the true scope of the claims. It would therefore be improper to import any meaning into any of the claims simply on the basis of illustrative language that is provided here only under obligation to satisfy Patent Office rules for maintaining an Appeal.

multipath signals in a searcher portion of the wireless communication device (5004);determining a signal-to-noise ratio (SNR) level of the one of the multipath signals (5006); and evaluating the one of the multipath signals for categorization into one of a plurality of states using at least one SNR threshold (5008). The method also includes generating a finger assignment by selectively providing the one of the multipath signals for a demodulation operation based upon its state (5009a, 5009b, 5009c); and receiving the finger assignment from the searcher portion of the communication device. The method also includes determining a signal-strength for the finger assignment (5010); enabling the finger assignment for a combine operation if the signal-strength for the finger assignment satiates a first signal-strength threshold (5012); and preventing the finger assignment from being deassigned if the signal-strength of the finger assignment satiates a second threshold, the second signal-strength threshold being less than the first signal-strength threshold. (Kindly refer to claim 1; Fig. 5 and page 22, line 16 through page 24, line 26 of the filed application.)

In accordance with another representative embodiment, a wireless communication device for managing multipath signals and for managing a finger assignment includes a searcher (224) adapted to scan for said multipath signals; a transceiver (204) coupled to the searcher; a processor (214) coupled to the searcher; and a computer readable memory unit (216). The computer readable memory unit is coupled to the processor and contains program instructions stored therein that execute, via the processor, and cause the processor to perform the steps of: receiving said multipath signals at said wireless communication device (5002); acquiring one of said multipath signals in a searcher portion of said wireless communication device (5004); determining a signal-to-noise ratio (SNR) level of said one of said multipath signals (5006); evaluating said one of said multipath signals for categorization into one of a plurality of states using at least one SNR threshold (5008); generating a finger assignment by selectively providing said one of said multipath signals for a demodulation operation based upon its state; receiving said finger assignment (5009a,5009b,5009c); determining a signal-strength for said finger assignment (5010); enabling said finger assignment for a combine operation if said

signal-strength for said finger assignment satiates a first signal-strength threshold (5012); and preventing said finger assignment from being deassigned if said signal-strength of said finger assignment satiates a second threshold, said second signal-strength threshold being less than said first signal-strength threshold. (Kindly refer to claim 19; Fig. 2 and Fig. 5; page 13, line 21 through page 14, line 15; and page 22, line 16 through page 24, line 26 of the filed application.)

In accordance with yet another representative embodiment, a computer readable medium containing therein computer readable codes for causing an electronic device to implement a method of managing said multipath signals includes: receiving the multipath signals at the wireless communication device (5002); acquiring one of the multipath signals in a searcher portion of the wireless communication device (5004);determining a signal-to-noise ratio (SNR) level of the one of the multipath signals (5006); and evaluating the one of the multipath signals for categorization into one of a plurality of states using at least one SNR threshold (5008). The method also includes generating a finger assignment by selectively providing the one of the multipath signals for a demodulation operation based upon its state (5009a, 5009b, 5009c); and receiving the finger assignment from the searcher portion of the communication device. The method also includes determining a signal-strength for the finger assignment (5010); enabling the finger assignment for a combine operation if the signal-strength for the finger assignment satiates a first signal-strength threshold (5012); and preventing the finger assignment from being deassigned if the signal-strength of the finger assignment satiates a second threshold, the second signal-strength threshold being less than the first signal-strength threshold. (Kindly refer to claim 37; Fig. 5 and page 22, line 16 through page 24, line 26 of the filed application.)

6. Grounds of Rejection to be Reviewed on Appeal

The issues in the present matter are whether:

I. Claims 1-8, 10-14 and 16-18 are properly rejected under 35 U.S.C. § 103(a) in view of *Daudelin* (U.S. Patent 6,972,807) in view of *Bi, et al.* (US Patent 6,515,977).

II. Claim 15 is properly rejected under 35 U.S.C. § 103(a) in view of *Daudelin, Bi, et al.* and *Karlsson, et al.* (US Patent 5,898,928).

III. Claims 19-32,34-50 and 52-54 are properly rejected under 35 U.S.C. § 103(a) in view of *Daudelin, Bi, et al.* and *Landberg, et al.* (US Patent 5,852,630).

7. Argument

In this portion of the Appeal Brief, arguments are provided. Notably, wherever applicable Applicants maintain previous arguments for patentability provided in response to Office Actions.

I. Rejection in view of *Daudelin* and *Bi, et al.*

The rejections of independent claims 1, 19 and 37 all rely on the combination of *Daudelin* and *Bi, et al.* In addition to their arguments traversing the rejection of the independent claims set forth in the Response under Rule 111, Applicants respectfully submit that because the applied art fails to disclose at least one other feature of each of claims 1, 19 and 37, a *prima facie* case of obviousness has not been properly established.

As stated in MPEP § 2143, in order to establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations.

i. Claim 1, 19 and 37

Claim 1 is drawn to a method of managing fingers for multipath signals in a

wireless communications device. The method includes:

"...determining a signal-to-noise ratio (SNR) level of said one of said multipath signals;

evaluating said one of said multipath signals for categorization into one of a plurality of states using at least one SNR threshold;..."

The Examiner directs Applicants to column 7, lines 24-50 of *Daudelin* for the alleged disclosure of the evaluating of one of the multipath signals for categorization into one of the plurality of states. The reference describes at this portion of the disclosure: FIG. 6 depicts a graph of the signal quality, SQ(t), of an illustrative constituent signal as a function of time, which signal has been assigned to a finger for the first time at time t_o.

> Referring to FIG. 6, the signal quality, SQ(t), of the illustrative constituent signal remains above the de-assignment threshold, T_D, through the probationary period, Δt_p, and, therefore, when the signal is de-assigned, the finger will enter the reserved state.
>
> Shortly after the probationary period ends, at time $t=t_{r1}$, the signal quality, SQ(t), of the illustrative constituent signal drops below the de-assignment threshold, T_D, and the signal is de-assigned from the finger, the finger enters the reserved state, and the reserved period, Δt_r, begins. At time $t=t_{r1}$, re-establishment threshold 601 increases logarithmically from T_1 towards T_1+T_2, from the beginning of the reserved period, Δt_{r1}. As can be seen in FIG. 6, the signal quality, SQ(t), of the illustrative constituent signal rises above re-establishment threshold 601 approximately half-way through the reserved period, Δt_{r1}, and, therefore, the signal is re-assigned to the finger and the finger re-enters the assigned state.
>
> Later, at time $t= t=t_{r2}$, the signal quality, SQ(t), of the illustrative constituent signal drops below the de-assignment threshold, T_D , again, and the signal is de-assigned again, the finger enters the reserved state again, and a second reserved period, Δt_{r2}, begins. But because the signal quality, SQ(t), of the illustrative constituent signal never rises above re-establishment threshold 602 during the reserved period, Δt_{r2}, the finger enters the inactive state at time $t=t_u$.

While certain de-assignment criteria are described, and the signal quality is referenced, there is no disclosure that categorization into one of a plurality of states uses at least one SNR threshold. The Examiner directs Applicants to the Background of the reference at column 2, where the arrival of four signals at a base station is described. The

signals are relatively phase-shifted and the signal quality (e.g., among other measures the SNR) of the signals are different due to interference or attenuation, among other things. While the characteristics of the signals as describe in column 2, lines 5-19 are described in terms of SNR in one example, Applicants respectfully submit that there is no disclosure of ***evaluating said one of said multipath signals for categorization into one of a plurality of states using at least one SNR threshold.*** Stated differently, while the reference may disclose the differing signal quality of signals in terms of SNR in the Background, there is no disclosure of its use for evaluating multipath signals for categorization as claimed. Moreover, there is no relation taught or suggested between the portion of column 2 and the portion of column 6 relied upon in the Office Action. Respectfully, Applicants submit that the Examiner has cobbled a rejection using unrelated portions of the applied art when there is no basis for their combination as asserted in the Office Action.

For at least the reasons set forth above, Applicants respectfully submit that the applied art fails to disclose at least one feature of claim 1 and therefore, a *prima facie* case of obviousness has not been properly established.

Claims 19 and 37 each include features similar to those discussed above. As such, and for at least the same reasons, Applicants respectfully submit that the applied art fails to disclose at least one feature of each of claims 19 and 37 and therefore, a *prima facie* case of obviousness has not been properly established.

Claims 2-18, 20-36 and 38-54, which depend from claims 1, 19 and 37, respectively, are patentable at least for the same reasons and in view of their additionally recited subject matter.

ii. Rejections improper

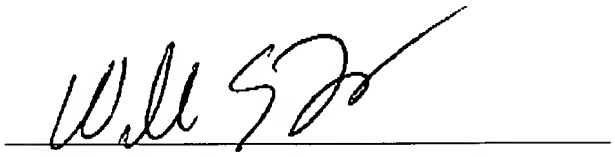
For at least the reasons set forth above, Applicants respectfully submit that a proper *prima facie* case of obviousness has not been established, claims 1-54 are patentable over the applied art.

8. Conclusion

In view of the foregoing, applicant(s) respectfully request(s): the withdrawal of all objections and rejections of record; the allowance of all the pending claims; and the holding of the application in condition for allowance.

Respectfully submitted on behalf of:

NXP BV



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Appendix

Claims on Appeal

Claims:

1. (Previously Presented) A method of managing fingers for multipath signals in a wireless communication device, said method comprising the steps of:

receiving said multipath signals at said wireless communication device;

acquiring one of said multipath signals in a searcher portion of said wireless communication device;

determining a signal-to-noise ratio (SNR) level of said one of said multipath signals;

evaluating said one of said multipath signals for categorization into one of a plurality of states using at least one SNR threshold;

generating a finger assignment by selectively providing said one of said multipath signals for a demodulation operation based upon its state;

receiving said finger assignment from said searcher portion of said communication device;

determining a signal-strength for said finger assignment;

enabling said finger assignment for a combine operation if said signal-strength for said finger assignment satiates a first signal-strength threshold; and

preventing said finger assignment from being deassigned if said signal-strength of said finger assignment satiates a second threshold, said second signal-strength threshold being less than said first signal-strength threshold.

2. (Original) The method recited in Claim 1 wherein said plurality of states includes three hierarchical states.

3. (Original) The method recited in Claim 1 wherein said plurality of states includes an assigned state, wherein signals associated with said assigned state are used for an active demodulation operation.

4. (Original) The method recited in Claim 1 wherein said plurality of states includes a potential state, wherein signals associated with said potential state are not actively used for an active demodulation operation, but which may be likely candidates for a future demodulation operation.

5. (Original) The method recited in Claim 1 wherein said plurality of states includes a temporary state, wherein said temporary state is not actively used for an active demodulation operation, but which may be likely candidates for categorization in a potential state in a future evaluation.

6. (Previously Presented) The method recited in Claim 1 wherein said one of said multipath signals is categorized according to said SNR level of said one of said multipath signals.

7. (Previously Presented) The method recited in Claim 1 wherein said one of said multipath signals is categorized according to a time period over which said SNR level of said one of said multipath signals exists.

8. (Previously Presented) The method recited in Claim 3 further comprising the step of:

enabling said one of said multipath signals for said demodulation operation if it is categorized in said assigned state.

9. (Previously Presented) The method recited in Claim 1 wherein said first five steps are repeated to provide a quantity of multipath signals at least equivalent to a number of fingers in a receiver portion of said wireless communication device.

10. (Previously Presented) The method recited in Claim 1 further comprising the step of:

determining a time period over which said signal-strength of said finger assignment satiates said second signal-strength threshold.

11. (Previously Presented) The method recited in Claim 10 further comprising the step of:

preventing said finger assignment from being deassigned if said time period satiates a time threshold.

12. (Previously Presented) The method recited in Claim 10 further comprising the step of:

allowing said finger assignment to be deassigned if said finger assignment fails to satiate said time threshold.

13. (Previously Presented) The method recited in Claim 1 further comprising the step of:

allowing said finger assignment to be deassigned if said finger assignment fails to satiate said second signal-strength threshold.

14. (Previously Presented) The method recited in Claim 1 further comprising the step of:

demodulating said finger assignment.

15. (Previously Presented) The method recited in Claim 1 further comprising the step of:

filtering said signal-strength of said finger assignment as determined in said signal-strength determining step.

16. (Previously Presented) The method of Claim 1 further comprising the step of:

categorizing said finger assignment into one of a plurality of states based upon

said signal-strength of said finger assignment.

17. (Previously Presented) The method of Claim 10 further comprising the step of:

categorizing said finger assignment into one of a plurality of states based upon said signal-strength of said finger assignment and based upon said time period over which said signals strength exists.

18. (Previously Presented) The method of Claim 16 further comprising the step of:

evaluating said finger assignment for said combine operation or for deassignment based upon its state.

19. (Previously Presented) A wireless communication device for managing multipath signals and for managing a finger assignment, said communication device comprising:

a searcher adapted to scan for said multipath signals;

a transceiver coupled to said searcher;

a processor, said processor coupled to said searcher; and

a computer readable memory unit, said computer readable memory unit coupled to said processor, said computer readable memory unit containing program instructions stored therein that execute, via said processor, and cause the processor to perform the steps of:

receiving said multipath signals at said wireless communication device;

acquiring one of said multipath signals in a searcher portion of said wireless communication device;

determining a signal-to-noise ratio (SNR) level of said one of said multipath signals;

evaluating said one of said multipath signals for categorization into one of

a plurality of states using at least one SNR threshold;

generating a finger assignment by selectively providing said one of said multipath signals for a demodulation operation based upon its state;

receiving said finger assignment;

determining a signal-strength for said finger assignment;

enabling said finger assignment for a combine operation if said signal-strength for said finger assignment satiates a first signal-strength threshold; and

preventing said finger assignment from being deassigned if said signal-strength of said finger assignment satiates a second threshold, said second signal-strength threshold being less than said first signal-strength threshold.

20. (Previously Presented) The device recited in Claim 19 wherein said plurality of states includes three hierarchical states.

21. (Previously Presented) The device recited in Claim 19 wherein said plurality of states includes an assigned state, wherein signals associated with said assigned state are used for an active demodulation operation.

22. (Previously Presented) The device recited in Claim 19 wherein said plurality of states includes a potential state, wherein signals associated with said potential state are not actively used for an active demodulation operation, but which may be likely candidates for a future demodulation operation.

23. (Previously Presented) The device recited in Claim 19 wherein said plurality of states includes a temporary state, wherein said temporary state is not actively used for an active demodulation operation, but which may be likely candidates for categorization in a potential state in a future evaluation.

24. (Previously Presented) The device recited in Claim 19 wherein said one of

said multipath signals is categorized according to said SNR level of said one of said multipath signals.

25. (Previously Presented)The device recited in Claim 19 wherein said one of said multipath signals is categorized according to a time period over which said SNR level of said one of said multipath signals exists.

26. (Previously Presented) The device recited in Claim 21 further comprising the step of:

enabling said one of said multipath signals for said demodulation operation if it is categorized in said assigned state.

27. (Previously Presented) The device recited in Claim 19 wherein said first five steps are repeated to provide a quantity of multipath signals equivalent to, or greater than, a number of fingers in a receiver portion of said wireless communication device.

28. (Previously Presented) The device recited in Claim 19 further comprising the step of:

determining a time period over which said signal-strength of said finger assignment satiates said second signal-strength threshold.

29. (Previously Presented) The device recited in Claim 28 further comprising the step of:

preventing said finger assignment from being deassigned if said time period satiates a time threshold.

30. (Previously Presented) The device recited in Claim 28 further comprising the step of:

allowing said finger assignment to be deassigned if said finger assignment fails to

satiate said time threshold.

31. (Previously Presented) The device recited in Claim 19 further comprising the step of:

allowing said finger assignment to be deassigned if said finger assignment fails to satiate said second signal-strength threshold.

32. (Previously Presented) The device recited in Claim 19 further comprising the step of:

demodulating said finger assignment.

33. (Previously Presented) The device recited in Claim 19 further comprising the step of:

filtering said signal-strength of said finger assignment as determined in said signal-strength determining step.

34. (Previously Presented) The device of Claim 19 further comprising the step of:

categorizing said finger assignment into one of a plurality of states based upon said signal-strength of said finger assignment.

35. (Previously Presented) The device of Claim 28 further comprising the step of:

categorizing said finger assignment into one of a plurality of states based upon said signal-strength of said finger assignment and based upon said time period over which said signals strength exists.

36. (Previously Presented) The method of Claim 34 further comprising the step of:

evaluating said finger assignment for said combine operation or for deassignment based upon its state.

37. (Previously Presented) A computer readable medium containing therein computer readable codes for causing an electronic device to implement a method of managing said multipath signals, said method comprising the steps of:

receiving said multipath signals at said wireless communication device;

acquiring one of said multipath signals in a searcher portion of said wireless communication device;

determining a signal-to-noise ratio (SNR) level of said one of said multipath signals;

evaluating said one of said multipath signals for categorization into one of a plurality of states using at least one SNR threshold;

generating a finger assignment by selectively providing said one of said multipath signals for a demodulation operation based upon its state;

receiving said finger assignment;

determining a signal-strength for said finger assignment;

enabling said finger assignment for a combine operation if said signal-strength for said finger assignment satiates a first signal-strength threshold; and

preventing said finger assignment from being deassigned if said signal-strength of said finger assignment satiates a second threshold, said second signal-strength threshold being less than said first signal-strength threshold.

38. (Previously Presented) The computer readable medium recited in Claim 37 wherein said plurality of states includes three hierarchical states.

39. (Previously Presented) The computer readable medium recited in Claim 37 wherein said plurality of states includes an assigned state, wherein signals associated with said assigned state are used for an active demodulation operation.

40. (Previously Presented) The computer readable medium recited in Claim 37

wherein said plurality of states includes a potential state, wherein signals associated with said potential state are not actively used for an active demodulation operation, but which may be likely candidates for a future demodulation operation.

41. (Previously Presented) The computer readable medium recited in Claim 37 wherein said plurality of states includes a temporary state, wherein said temporary state is not actively used for an active demodulation operation, but which may be likely candidates for categorization in a potential state in a future evaluation.

42. (Previously Presented) The computer readable medium recited in Claim 37 wherein said one of said multipath signals is categorized according to said SNR level of said one of said multipath signals.

43. (Previously Presented) The computer readable medium recited in Claim 37 wherein said one of said multipath signals is categorized according to a time period over which said SNR level of said one of said multipath signals exists.

44. (Previously Presented) The computer readable medium recited in Claim 39 further comprising the step of:

enabling said one of said multipath signals for said demodulation operation if it is categorized in said assigned state.

45. (Previously Presented) The computer readable medium recited in Claim 37 wherein said first five steps are repeated to provide a quantity of multipath signals equivalent to, or greater than, a number of fingers in a receiver portion of said wireless communication device.

46. (Previously Presented) The computer readable medium recited in Claim 37 further comprising the step of:

determining a time period over which said signal-strength of said finger

assignment satiates said second signal-strength threshold.

47. (Previously Presented) The computer readable medium recited in Claim 46 further comprising the step of:

preventing said finger assignment from being deassigned if said time period satiates a time threshold.

48. (Previously Presented) The computer readable medium recited in Claim 46 further comprising the step of:

allowing said finger assignment to be deassigned if said finger assignment fails to satiate said time threshold.

49. (Previously Presented) The computer readable medium recited in Claim 37 further comprising the step of:

allowing said finger assignment to be deassigned if said finger assignment fails to satiate said second signal-strength threshold.

50. (Previously Presented) The computer readable medium recited in Claim 37 further comprising the step of:

demodulating said finger assignment.

51. (Previously Presented) The computer readable medium recited in Claim 37 further comprising the step of:

filtering said signal-strength of said finger assignment as determined in said signal-strength determining step.

52. (Previously Presented) The computer readable medium recited in Claim 37 further comprising the step of:

categorizing said finger assignment into one of a plurality of states based upon said signal-strength of said finger assignment.

53. (Previously Presented) The computer readable medium recited in Claim 46 further comprising the step of:

categorizing said finger assignment into one of a plurality of states based upon said signal-strength of said finger assignment and based upon said time period over which said signals strength exists.

54. (Previously Presented) The computer readable medium recited in Claim 52 further comprising the step of:

evaluating said finger assignment for said combine operation or for deassignment based upon its state.

Appendix

Evidence (None)

Appendix

Related Proceedings (None)